

1140  
RC  
Box





SERIES-PARALLEL  
R-C COMBINATION BOX

MODEL

1140

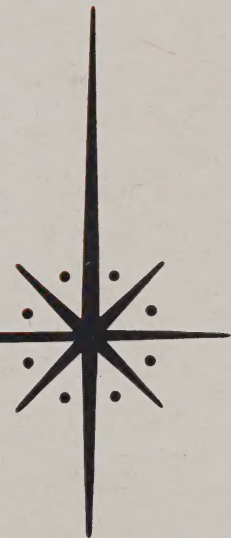


**EICO**

INSTRUCTION

MANUAL

1140-1



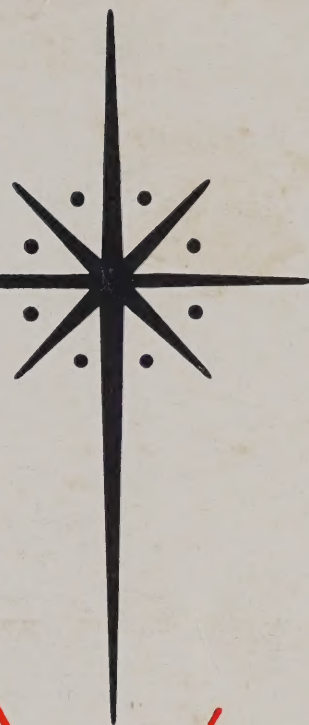
ELECTRONIC INSTRUMENT CO. INC.  
3300 NORTHERN BLVD., L. I. CITY 1, N. Y.

**EICO**



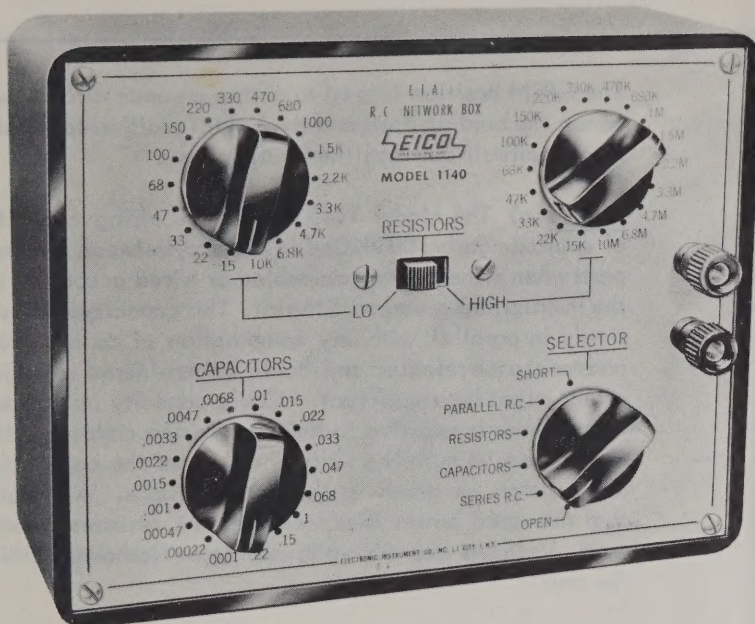


ANOTHER PERFORMANCE PROVEN PRODUCT









## SERIES-PARALLEL

## R-C COMBINATION BOX

## MODEL 1140

### general description

#### GENERAL

The EICO Model 1140\* Series/Parallel R-C Combination 1 Box is an extremely valuable combination of the Model 1100 Resistance Box and the Model 1120 Capacitance Box with additional switching facilities that permit selection of any resistance along, any capacitance alone, or any combination of resistance and capacitance in either series or parallel. Open circuit and short circuit positions are provided as well. This box permits you to substitute or develop a desired integrating or differentiating RC network with a minimum of trouble. The Model 1140 is a valuable instrument for tv, radio and audio servicing, as well as general laboratory work and experimentation. Standard E. I. A. (RETMA) capacitance and resistance values with 10% are provided from 0.0001 to 0.22mfd and 15 ohms to 10 megohms. Capacitors are either molded or ceramic types, most conservatively rated at 600 volts. Resistors are of the standard 1 watt carbon type. Convenient jack-top binding posts are supplied.

#### SPECIFICATIONS

Capacitors (mfd): .0001, .00022, .00047  
.001, .0015, .0022, .0033, .0047, .0068  
.01, .015, .022, .033, .047, .068  
.1, .15, .22

Resistors: 15 ohms to 10 megohms in decade multiples of 15, 22, 33, 47, 68, and 100 ohms.

\*Patent #2, 954, 518

Rated Accuracy: capacitors .0001 mfd through .0047 mfd:  $\pm 5\%$ .  
capacitors .001 mfd through .22 mfd:  $\pm 10\%$ .  
resistors:  $\pm 10\%$

Voltage Ratings: capacitors 0001 mfd through .0047 mfd: 500 volts.  
capacitors .001 mfd through .1 mfd 600 volts.  
capacitors .015 and .22 mfd : 400 volts  
resistors: 500 volts.

Power Rating (resistors): 1 watt

Type of components: capacitors: silver mica and molded plastic tubular.  
resistors: carbon

Switched Modes of Operation: resistor (alone), capacitors (alone), series R-C, parallel R-C, short circuit, open circuit.

Panel: deep-etched, satin finish aluminum.

Cabinet: high-impact molded black bakelite.

Size: 6 3/4" x 5 1/4" x 2 3/8".

Weight: 2 lbs.



## operation

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**Resistance Selection:** a) Set the RESISTORS HIGH-LOW slide switch at LOW if the resistance desired is included in the LOW decade range (15 ohms to 10,000 ohms) or at HIGH if the resistance desired is included in the HIGH decade range (15,000 ohms to 10 megohms). b) Set the knob of the RESISTORS decade selected at the desired resistance value.

**Capacitance Selection:** Set the knob of the CAPACITORS switch at the desired capacitance value.

**Mode of Operation Selection:** The SELECTOR switch permits choice of modes of operation. Use the RESISTORS positions to obtain the selected resistance value alone, the CAPACITORS position for the selected capacitance value alone, the SERIES RC position to place the selected resistor and capacitor in series, the PARALLEL RC position to place the selected resistor and capacitor in parallel.

## maintenance

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### SERVICE CONSULTATION

If you are experiencing trouble that you cannot diagnose yourself, you are invited to avail yourself of the EICO Service Consultation Department. The consultant handling your inquiry will make every effort to diagnose the cause of your particular difficulty based on the information that you provide. Please be as thorough as possible. Include the following information about your unit:

- a) Have you made a thorough check of the wiring, checking also for cold solder joints, or accidental shorting between parts, or to chassis? (Check to see whether a bare wire or lead extends far enough to be shorted when the bottom plate is put on).
- b) Does the trouble occur at one time or one operating situation, but not at another time or operating situation? Be as specific as possible in this respect.
- c) Have you observed any peculiarity about a part? If a part appears charred or otherwise damaged by excessive heat, please say so. If you think you have damaged a particular part in the assembly or wiring, please say so. In conjunction with the symptoms, the consultant may be able to determine whether such a part is likely to be defective.

In addition, list any code numbers in red under the words INSTRUCTION MANUAL on the cover of the book provided with your unit. If the unit bears a serial number, it is essential that you include this also.

The OPEN position is used to obtain an open circuit between the binding posts and the SHORT position to obtain a short circuit between the binding posts.

**Notes:** a) The Model 1140 has a stray wiring capacity of approximately .000020 mfd (20 mmfd) between binding posts when either factory assembled or wired according to the instructions given with the kit. This capacity is effectively in parallel with any combination of capacitance and resistance selected and should be considered when its effect might be significant. Cable capacity in the external leads is additive to the stray wiring capacity. b) Please bear in mind the voltage ratings of the capacitors and resistors as given in the specifications. Also note that the rated power dissipation of the resistors is one watt. Voltages over 500 volts may cause flashover within the unit.

### PARTS REPLACEMENT

If it appears that a component is defective, and you desire a replacement from EICO, address your correspondence to our Customer Service Department.

If you are claiming the right to a no-charge replacement under the terms and conditions of the warranty, it is required that you shall have sent in the registration card within 10 days of the date of purchase, and you send back the defective part transportation prepaid. EICO will make the necessary replacement at no charge for parts eligible under the terms and conditions of the warranty.

Further information required on a part returned to the factory for a no-charge replacement under the terms and conditions of the warranty is as follows:

- a) Model number and serial number, if any, of unit. Also any code numbers in red under the words INSTRUCTION MANUAL on the cover of the book supplied with the unit.
- b) Stock number and description of part as given on the parts list.
- c) Describe as completely as possible the nature of the defect, or your reason for requiring replacement.

### FACTORY REPAIR SERVICE

EICO maintains a Factory Repair Service Department for in-warranty or out-of-warranty repair of EICO equip-



## PANEL MOUNTING

Note insert drawing for correct position in mounting of all switches.

1. (✓) Fig. 1. Turn switches S1, S2 and S3 to the maximum counter-clockwise position. In this position, the rotor hits contact #1. Mount each switch as shown, using one  $\frac{3}{8}$  lockwasher behind the panel, one  $\frac{3}{8}$  flatwasher and one  $\frac{3}{8}$  hex nut on the front of the panel.
2. (✓) Fig. 1. Mount slide switch, S4 as shown. Use two #4-40 screws, two #4 lockwashers and two #4-40 hex nuts.
3. (✓) Fig. 1. Turn the small rotary switch, S5 to maximum counter-clockwise position. Mount as shown using one  $\frac{3}{8}$  lockwashers behind the panel, one  $\frac{3}{8}$  flatwasher and one  $\frac{3}{8}$  hex nut on the front of the panel.
4. (✓) Fig. 1. Mount the insulated binding posts, J1 and J2 as shown. Mount each jack, using a bakelite shoulder washer on the front of the panel and a bakelite flatwasher behind the panel. Tighten each post with one #8 lockwasher and one #8-32 hex nut. Slide a #8 lug over the nut and secure with another #8-32 hex nut as shown.



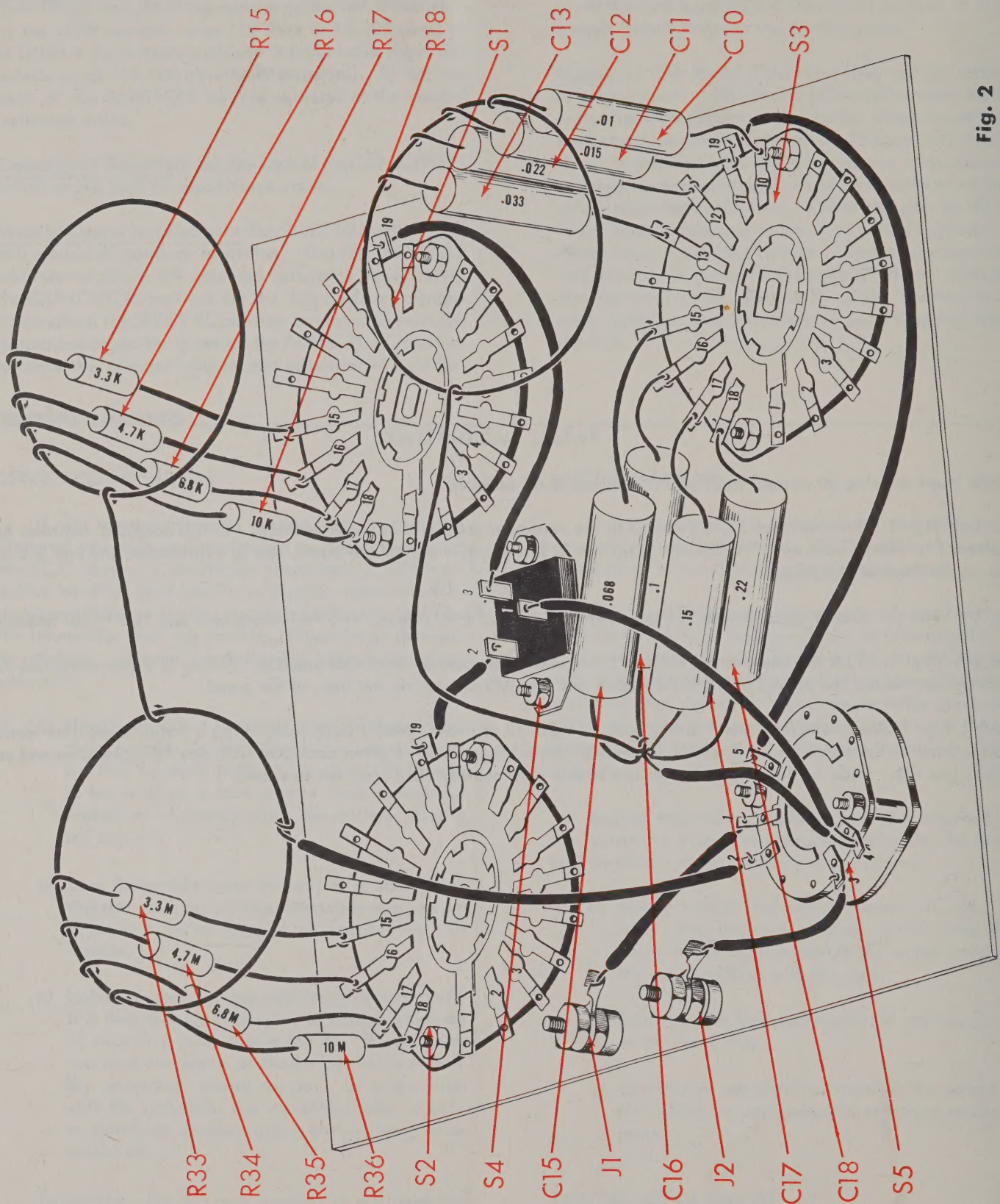


Fig. 2





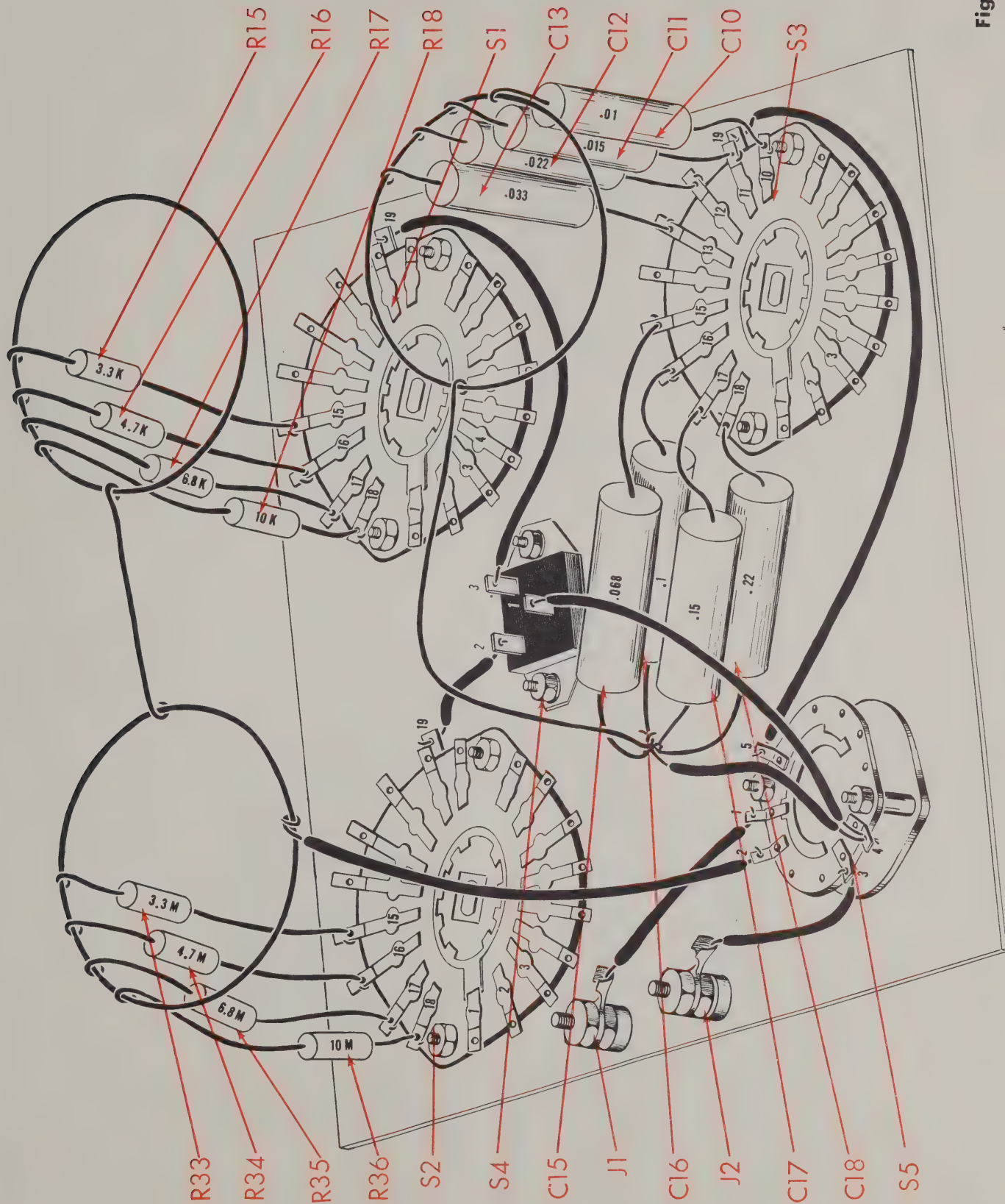


Fig. 3



## WIRING

1. ~~( )~~ ☒ Fig 2. Stretch the piece of heavy bare wire to eliminate any kinks. Cut three 7 1/4" lengths. Form each piece of wire into a ring of approximately 2" diameter. Overlap the extra lengths of wire and solder.

2. ~~( )~~ ☒ Fig. 2. Cut both leads on all resistors to 1/2".

3. ~~( )~~ ☒ Fig. 2. Low value resistors (15Ω to 10KΩ) are mounting on switch S1. High value resistors (15KΩ to 10MΩ) are mounted on S2. Connect one end of the 10KΩ (brown, black, orange, silver) resistor, R18, to S1-18 (S). Leave approximately 1/4" of wire between the resistor body and the switch contact.

4. ~~( )~~ ☐ Fig. 2. Similar to the above, connect and solder the following resistors to the indicated contact on the switches.

RESISTOR	CONTACT
<del>( )</del> <input checked="" type="checkbox"/> R17	6.8KΩ blue, grey, red, silver S1-17
<del>( )</del> <input type="checkbox"/> R16	4.7KΩ yellow, violet, red, silver S1-16
<del>( )</del> <input type="checkbox"/> R15	3.3KΩ orange, orange, red, silver S1-15
<del>( )</del> <input type="checkbox"/> R14	2.2KΩ red, red, red, silver S1-14
<del>( )</del> <input type="checkbox"/> R13	1.5KΩ brown, green, red, silver S1-13
<del>( )</del> <input type="checkbox"/> R12	1KΩ brown, black, red, silver S1-12
<del>( )</del> <input type="checkbox"/> R11	680Ω blue, grey, brown, silver S1-11
<del>( )</del> <input type="checkbox"/> R10	470Ω yellow, violet, brown, silver S1-10
<del>( )</del> <input type="checkbox"/> R9	330Ω orange, orange, brown, silver S1-9
<del>( )</del> <input type="checkbox"/> R8	220Ω red, red, brown, silver S1-8

<del>( )</del> <input type="checkbox"/> R7	150Ω	brown, green, brown, silver	S1-7
<del>( )</del> <input type="checkbox"/> R6	100Ω	brown, black, brown, silver	S1-6
<del>( )</del> <input type="checkbox"/> R5	68Ω	blue, grey, black, silver	S1-5
<del>( )</del> <input type="checkbox"/> R4	47Ω	yellow, violet, black, silver	S1-4
<del>( )</del> <input type="checkbox"/> R3	33Ω	orange, orange, black, silver	S1-3
<del>( )</del> <input type="checkbox"/> R2	22Ω	red, red, black, silver	S1-2
<del>( )</del> <input type="checkbox"/> R1	15Ω	brown, green, black, silver	S1-1
<del>( )</del> <input type="checkbox"/> R36	10MΩ	brown, black, blue, silver	S2-18
<del>( )</del> <input type="checkbox"/> R35	6.8MΩ	blue, grey, green, silver	S2-17
<del>( )</del> <input type="checkbox"/> R34	4.7MΩ	yellow, violet, green, silver	S2-16
<del>( )</del> <input type="checkbox"/> R33	3.3MΩ	orange, orange, green, silver	S2-15
<del>( )</del> <input type="checkbox"/> R32	2.2MΩ	red, red, green, silver	S2-14
<del>( )</del> <input type="checkbox"/> R31	1.5MΩ	brown, green, green, silver	S2-13
<del>( )</del> <input type="checkbox"/> R30	1MΩ	brown, black, green, silver	S2-12
<del>( )</del> <input type="checkbox"/> R29	680KΩ	blue, grey, yellow, silver	S2-11
<del>( )</del> <input type="checkbox"/> R28	470KΩ	yellow, violet, yellow, silver	S2-10
<del>( )</del> <input type="checkbox"/> R27	330KΩ	orange, orange, yellow, silver	S2-9
<del>( )</del> <input type="checkbox"/> R26	220KΩ	red, red, yellow, silver	S2-8
<del>( )</del> <input type="checkbox"/> R25	150KΩ	brown, green, yellow, silver	S2-7
<del>( )</del> <input type="checkbox"/> R24	100KΩ	brown, black, yellow, silver	S2-6
<del>( )</del> <input type="checkbox"/> R23	68KΩ	blue, grey, orange, silver	S2-5
<del>( )</del> <input type="checkbox"/> R22	47KΩ	yellow, violet, orange, silver	S2-4
<del>( )</del> <input type="checkbox"/> R21	33KΩ	orange, orange, orange, silver	S2-3
<del>( )</del> <input type="checkbox"/> R20	22KΩ	red, red, orange, silver	S2-2
<del>( )</del> <input type="checkbox"/> R19	15KΩ	brown, green, orange, silver	S2-1



## IN CASE OF DIFFICULTY

If the completed kit does not operate properly, refer to the MAINTENANCE section and read it thoroughly. The information provided may itself lead to a solution of the problem without outside assistance, and also includes the course of action you may take to obtain assistance from EICO. In any case, do not neglect the checking procedures which usually correct 90% of the difficulties that may be encountered. If you omitted to perform step 1 of

the Final Steps "To catch any wiring errors.....", do it now, and do it thoroughly. Often, a person is unable to detect his own errors because he misunderstands an instruction. For this reason, have a friend go over the wiring with you, if possible. Also, do not neglect the obvious kind of mistake or trouble such as tubes or transistors placed incorrectly, shields not making proper contact, accidental shorting of leads or parts to the bottom plate, line cord plug making improper contact in outlet, blown fuse, etc.

1. ( ) Fig. 3. All capacitors are to be mounted on S3. On the following capacitors, cut all leads to 3/4". Solder one lead to the contacts indicated below. Leave a 1/2" lead length between the contact and the body of the capacitor.

( ) C1	100mfd	brown, black, brown, green	S3-1
( ) C2	220mfd	red, red, brown, green	S3-2
( ) S3	470mfd	yellow, violet, brown, green	S3-3

2. ( ) Fig. 3. On the following capacitors, cut all leads to 1/2". Solder one end to the contact indicated below. Leave a 1/4" lead length between the contact and the body of the capacitor.

( ) C4	.001 mfd	brown, black, red, silver, blue	S3-4
( ) C5	.0015 mfd	brown, green, red, silver, blue	S3-5
( ) C6	.0022 mfd	red, red, red, silver, blue	S3-6
( ) C7	.0033 mfd	orange, orange, red, silver, blue	S3-7
( ) C8	.0047 mfd	yellow, violet, red, silver, blue	S3-8
( ) C9	.0068 mfd	blue, grey, red, silver, blue	S3-9

3. ( ) Fig. 3. On the following capacitors, cut one lead to 1/2" and the other lead to 3/4". Solder the 3/4" lead from one end of each capacitor to the contact indicated below. Leave a 1/2" lead length between the contact and the body of the capacitor.

( ) C10	.01 mfd	brown, black, orange, silver, blue	S3-10
( ) C11	.015 mfd	brown, green, orange, silver, blue	S3-11
( ) C12	.022 mfd	red, red, orange, silver, blue	S3-12
( ) C13	.033 mfd	orange, orange, orange, silver, blue	S3-13

4. ( ) Fig. 3. Cut both leads on a .047 mfd (yellow, violet, orange, silver, blue) capacitor, C14, to 3/4". Cover one lead with a 1/2" piece of spaghetti and connect to S3-14 (S).

5. ( ) Fig. 3. Cut one lead on each of the remaining four capacitors to 1". Cut the remaining lead on each of the capacitors to 1 1/2". Cover each of the longer leads with a 1 1/4" piece of spaghetti and connect to the switch contact indicated below.

( ) C15	.068 mfd	blue, grey, orange, silver, blue	S3-15
( ) C16	.1 mfd	brown, black, yellow, silver, blue	S3-16
( ) C17	.15 mfd	brown, green, yellow, silver, yellow	S3-17
( ) C18	.22 mfd	red, red, yellow, silver, yellow	S3-18

6. ( ) Fig. 3. Wrap unsoldered leads of all resistors (soldered to S1) around one of the previously prepared rings as shown. Solder all leads from the 18 resistors to this ring. The ring should be suspended in the air by the resistors parallel to the switch.

7. ( ) Fig. 3. Similar to the above, wrap unsoldered leads of all resistors (soldered to S2) around a second one of the previously prepared rings as shown. Solder all leads from the 18 resistors to this ring. The ring should be suspended in the air by the resistors parallel to the switch.

8. ( ) Fig. 3. Similar to the above, wrap unsoldered leads of capacitors, C1 through C14 (soldered to S3) around the third of the previously prepared rings as shown. Solder the leads of these capacitors to the ring. The ring should be suspended in the air by the capacitors parallel to the switch. The height of each ring should be no greater than 2-1/8" above the panel.

9. ( ) Fig. 3. Twist the lead of the remaining four capacitors, C15 through C18, together as shown. Around these leads, twist one end of a 5" piece of bare wire and a 2 1/2" piece of insulated wire. Solder all these leads together. Be careful that solder should flow over all of these wires at the twisted connection. Connect the remaining end of the insulated wire to S5-4(C) and the remaining end of the bare wire to the ring (S) over the capacitor switch S3.

10. ( ) Fig. 3. Connect a 4" piece of wire from S5-4 (S) to S4-1 (S).

11. ( ) Fig. 3. Connect an 8" piece of wire from S5-5 (S) to lugs (S) on front side of S3.

12. ( ) Fig. 3. Connect a 6" piece of wire from S4-3 (S) to lug (S) on front side of S1.

13. ( ) Fig. 3. Connect a 2" piece of wire from S4-2 (S) to lug (S) on front side of S2.

14. ( ) Fig. 3. Connect a 2" piece of wire from S5-1 (S) to jack J1 (S).

15. ( ) Fig. 3. Connect a 2" piece of wire from S5-3 (S) to jack J2 (S).

16. ( ) Fig. 3. Connect a 2" piece of bare wire from the ring (S) suspended above S1 to the ring (S) suspended above S2.

17. ( ) Fig. 3. Connect a 2 1/2" piece of wire from S5-2 (S) to ring (S) suspended above S2.

18. ( ) Fig. 3. Mount the panel in the cabinet. Use four #4 screws.

19. ( ) Fig. 2. Put knobs over all four shafts on the controls. The LOW resistor knob should face "15", the HIGH resistor knob should face "15", the CAPACITOR knob should face ".0001" and the SELECTOR knob should face "OPEN". Tighten all set screws. Your instrument is now complete and ready for use.



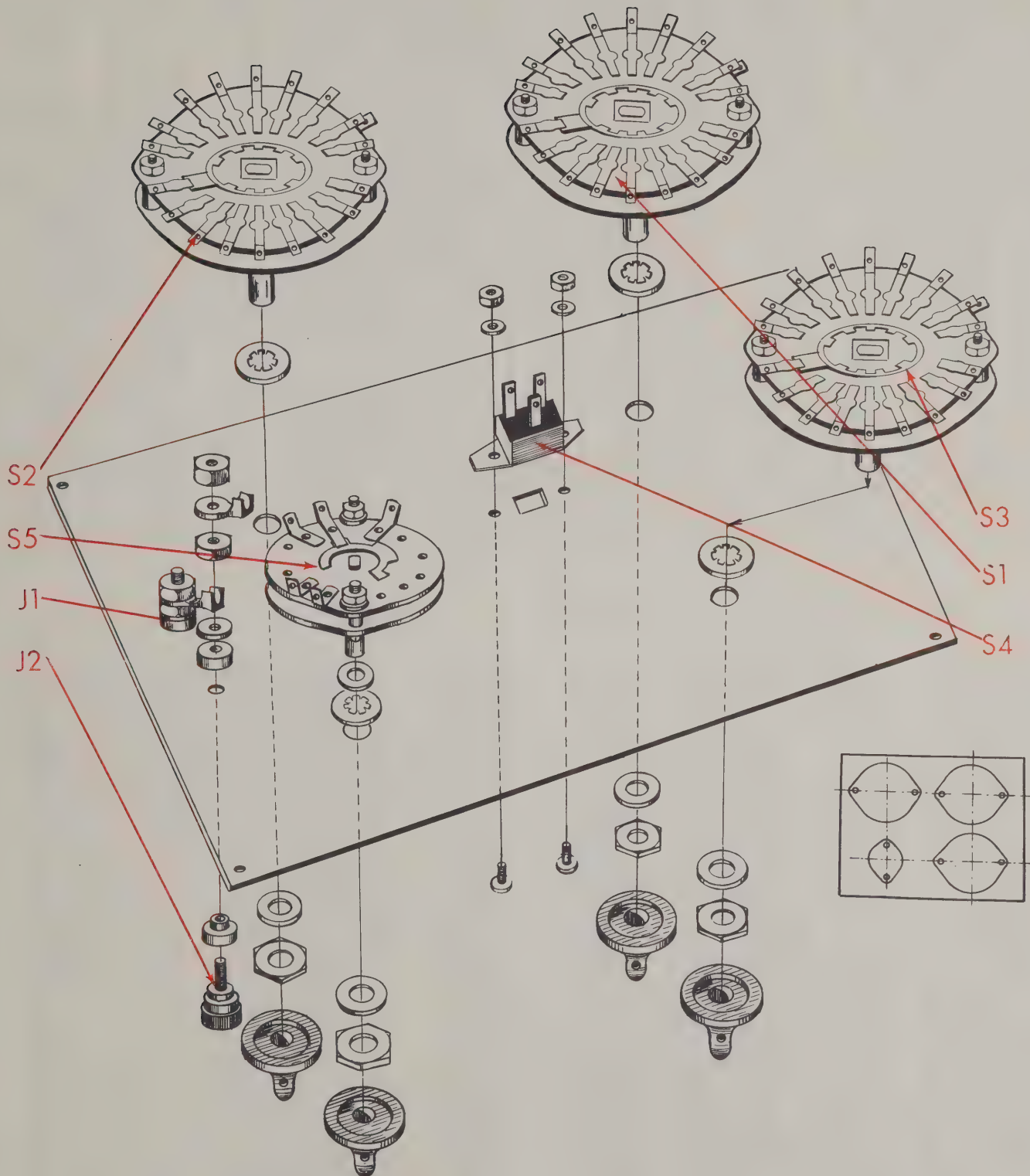


Fig. 1



## GENERAL INSTRUCTIONS

The section of the manual beginning with this page is the CONSTRUCTION section. All pages in this section have page numbers followed by "C" (1C, 2C, etc.). The INSTRUCTION section resumes on the pages following the CONSTRUCTION section. Note that the CONSTRUCTION section is located centrally in the book and may be removed without disrupting the INSTRUCTION section that both precedes it and follows it.

Care taken in the construction of this instrument will reward the constructor with many years of satisfactory service and greater confidence in his instrument. We urge you to not rush the construction, but to take all the time necessary for proper assembly and wiring.

Furthermore, we urge strongly that you follow the wire and parts layout shown in the pictorial diagrams as closely as possible. Very often wires are placed as shown for a good reason, and certainly the appearance of the completed instrument will be improved and the difficulty of finding a wiring error will be reduced by the following the wire and parts layout shown.

UNPACKING THE KIT: Unpack the kit carefully and check each part against the parts list including those parts that are mounted to the chassis. If you have trouble identifying any parts refer to the pictorial diagrams or the color code chart.

You will find that the value of a component will vary within the allowable circuit tolerance. For example, the  $4.7K\Omega$ ,  $\pm 10\%$  resistor may measure anywhere between  $4.2K\Omega$  and  $5.2K\Omega$ . Tolerances on paper capacitors are substantially greater, and the tolerance for electrolytics is usually  $\pm 100\%$  and  $-50\%$ .

CONSTRUCTION HINTS: USE THE BEST GRADE OF ROSIN CORE SOLDER ONLY, preferably one containing the new activated fluxes such as Kester "Resin-Five", Ersin "Multicore" or similar types. UNDER NO CIRCUMSTANCES USE ACID CORE SOLDER OR ACID FLUX since acid flux can cause serious corrosion. Before soldering make a certain of a good mechanical connection. Use a clean, freshly tinned soldering iron, no smaller than 100 watts, and place the solder on the joint (not on the iron) so that the solder is melted by the heat from the joint itself. Do not remove the soldering iron until the solder flows and check to see that the resulting joint is smooth and shiny when the solder has cooled. There are two extremes to be avoided; too little heat and too much heat. If too little heat is supplied, the joint will appear pitted and grey, indicating a rosin joint which is unsatisfactory. On the other hand, if too much heat is applied to a joint, the parts connected to it may either change value, lose their protective coating, or break down. If you are soldering close to a part, hold the lead between the part and the joint being sol-

dered with the tip of a pair of longnose pliers. The pliers will conduct the heat away and prevent the component from being unduly overheated. If for any reason it is necessary to resolder a joint, be sure to use new solder.

It should also be noted that the leads on resistors, capacitors, and transformers are often longer than required. These leads should be trimmed to the proper length when necessary. Do not cut any lead until you have determined the required length when the lead is routed as shown in the diagrams.

BASIC TOOLS REQUIRED: These basic tools are required for the construction of the amplifier.

1. Screwdriver -  $3/16"$  to  $1/4"$  blade
2. Screwdriver -  $1/8"$  blade
3. Longnose pliers - 5 or 6"
4. Diagonal cutters
5. Soldering iron (100 watts), or soldergun, or pencil iron (35 watts)
6. Gas pliers
7. High quality rosin or equivalent synthetic flux core solder. Do not use acid or paste flux under any circumstances.

A set of spintites and a wire stripper are also very useful supplementary tools.

PARTS IDENTIFICATION: Please note that very many of the parts for which color coding is given may not be color coded, but have their values and ratings printed. The letter K is a multiplier ( $\times 1000$ ) and on resistors or capacitors indicates that the printed numerical value must be multiplied by one thousand to obtain the value in ohms or micro-micro farads respectively. Note also that one microfarad (mf) is equal to one million; micro-microfarads (mmf). To aid in rapid identification, keep in mind that 5%, 10%, and 20% resistors are color coded whereas 1% resistor have their values printed; also that molded tubular capacitors may or may not be color coded, whereas disc capacitors and electrolytics will always have their values printed. Please note the following relationships between the units used to express resistance or capacity.

$1,000,000 \text{ ohms } (\Omega) = 1000 \text{ kilohms } (K\Omega) = 1 \text{ megohm } (M\Omega)$   
 $1,000,000 \text{ micro-micro farads (mmf)} = 1 \text{ micro farads (mf)}$

CONSTRUCTION PROCEDURE: The complete step-by-step mounting and wiring procedure follows. To keep the drawings uncrowded, unnecessary repetition of mounting or wiring details may be omitted. Note: The abbreviation (C) means connect but do not solder (until other leads have been connected). The abbreviation (S) means connect and solder. Bend the ground lug tabs on the sockets toward the chassis to prevent accidental shorting to the socket pins.

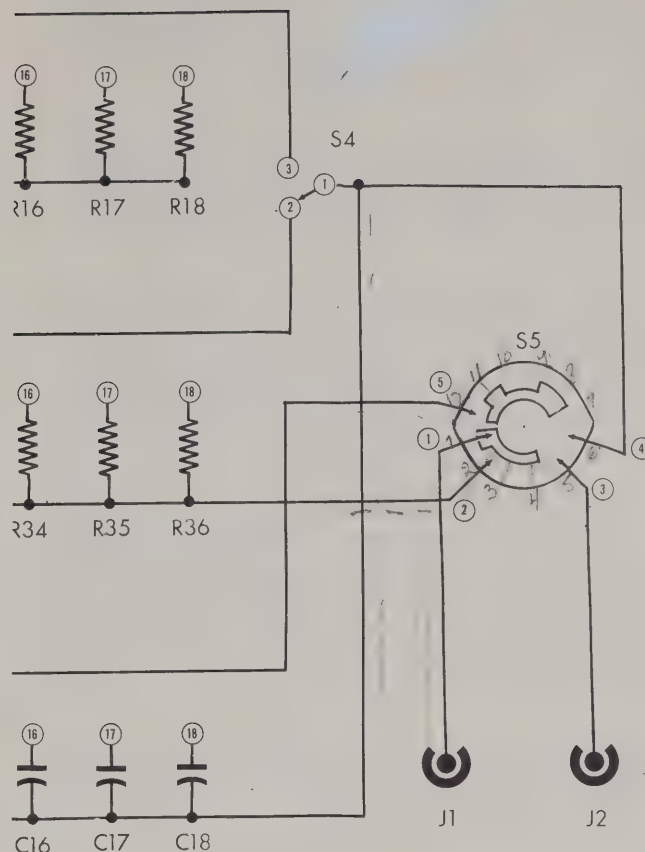


## THE EICO WARRANTY

The Electronic Instrument Company, Inc., hereafter referred to as EICO, warrants that, for a period of 90 days from the date of purchase, any EICO kit will be free of defects in parts, and that any EICO factory-wired unit will be free of defects in parts and workmanship. For an EICO kit, EICO's obligation is limited to those parts which are returned transportation prepaid to the factory without further damage, and in the judgement of EICO are either originally defective or have become defective in normal use. For an EICO factory-wired unit, EICO's obligation is limited to those parts, sections, or the entire unit which is returned transportation prepaid to the factory without further damage, and in the judgement of EICO are either originally defective or have become defective in normal use.

The warranty does not apply to any parts damaged in the course of handling, assembling, or wiring by the customer, or damaged due to abnormal usage or in violation of instructions or reasonable practice, or further damaged to a consequential degree in return shipment. Furthermore, the foregoing warranty is made only to the original customer, and is and shall be in lieu of all other warranties, whether expressed or implied, and of all other obligations or liabilities on the part of EICO, and in no event shall EICO be liable for any anticipated profits, consequential damages, loss of time, or other losses incurred by the customer in connection with the purchase or operation of EICO products or components thereof.

The registration card, which accompanies each EICO kit or factory-wired unit, must be filled in and returned to the company within 10 days after the date of purchase. This warranty applies only to registered units.



ATC DIAGRAM

Qt.	Stock#	Sym.	Description	Am't.
	10837	R34	res., 4.7M $\Omega$ (yellow, violet, green, silver) 1W, $\pm 10\%$	1
	10836	R35	res., 6.8M $\Omega$ (blue, grey, green, silver) 1W, $\pm 10\%$	1
	10835	R36	res., 10M $\Omega$ (brown, black, blue, silver) 1W, $\pm 10\%$	1
	60022	S1, 2, 3	switch, rotary, 1P-18 Pos.	3
	62002	S4	switch, slide, 1P-2 Pos.	1
	60059	S5	switch, rotary, 3P-6 Pos.	1
	40001		nut, hex, #3/8-32	4
	40007		nut, hex, #4-40	2
	40008		nut, hex, #8-32	4
	41016		screw, #4-40 x 1/4	6
	42000		washer, lock 3/8	4
	42001		washer, flat 3/8	4
	42007		washer, lock #4	2
	42043		washer, bakelite shoulder	2
	42044		washer, bakelite flat	2
	42046		washer, flat #8	2
	43004		lug, #8	2
	53006		knob, bar	4
	58000		wire, hook-up	length
	58300		spaghetti	length
	58500		wire, #18 bare	length
	58501		wire, #22 bare	length
	80060		panel	1
	88042		cabinet	1
	66065		manual of instructions (wired)	1
	66314		manual of instructions (kit)	1

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Furthermore, we urge strongly that you follow the wire and parts layout shown in the pictorial diagrams as closely as possible. Very often wires are placed as shown for a good reason, and certainly the appearance of the completed instrument will be improved and the difficulty of finding a wiring error will be reduced by the following the wire and parts layout shown.

UNPACKING THE KIT: Unpack the kit carefully and check each part against the parts list including those parts that are mounted to the chassis. If you have trouble identifying any parts refer to the pictorial diagrams or the color code chart.

You will find that the value of a component will vary within the allowable circuit tolerance. For example, the  $4.7K\Omega$ ,  $\pm 10\%$  resistor may measure anywhere between  $4.2K\Omega$  and  $5.2K\Omega$ . Tolerances on paper capacitors are substantially greater, and the tolerance for electrolytics is usually  $\pm 100\%$  and  $-50\%$ .

CONSTRUCTION HINTS: USE THE BEST GRADE OF ROSIN CORE SOLDER ONLY, preferably one containing the new activated fluxes such as Kester "Resin-Five", Ersin "Multicore" or similar types. UNDER NO CIRCUMSTANCES USE ACID CORE SOLDER OR ACID FLUX since acid flux can cause serious corrosion. Before soldering make a certain of a good mechanical connection. Use a clean, freshly tinned soldering iron, no smaller than 100 watts, and place the solder on the joint (not on the iron) so that the solder is melted by the heat from the joint itself. Do not remove the soldering iron until the solder flows and check to see that the resulting joint is smooth and shiny when the solder has cooled. There are two extremes to be avoided; too little heat and too much heat. If too little heat is supplied, the joint will appear pitted and grey, indicating a rosin joint which is unsatisfactory. On the other hand, if too much heat is applied to a joint, the parts connected to it may either change value, lose their protective coating, or break down. If you are soldering close to a part, hold the lead between the part and the joint being sol-

dered with the tip of a pair of longnose pliers. The pliers will conduct the heat away and prevent the component from being unduly overheated. If for any reason it is necessary to resolder a joint, be sure to use new solder.

It should also be noted that the leads on resistors, capacitors, and transformers are often longer than required. These leads should be trimmed to the proper length when necessary. Do not cut any lead until you have determined the required length when the lead is routed as shown in the diagrams.

BASIC TOOLS REQUIRED: These basic tools are required for the construction of the amplifier.

1. Screwdriver -  $3/16"$  to  $1/4"$  blade
2. Screwdriver -  $1/8"$  blade
3. Longnose pliers - 5 or 6"
4. Diagonal cutters
5. Soldering iron (100 watts), or soldergun, or pencil iron (35 watts)
6. Gas pliers
7. High quality rosin or equivalent synthetic flux core solder. Do not use acid or paste flux under any circumstances.

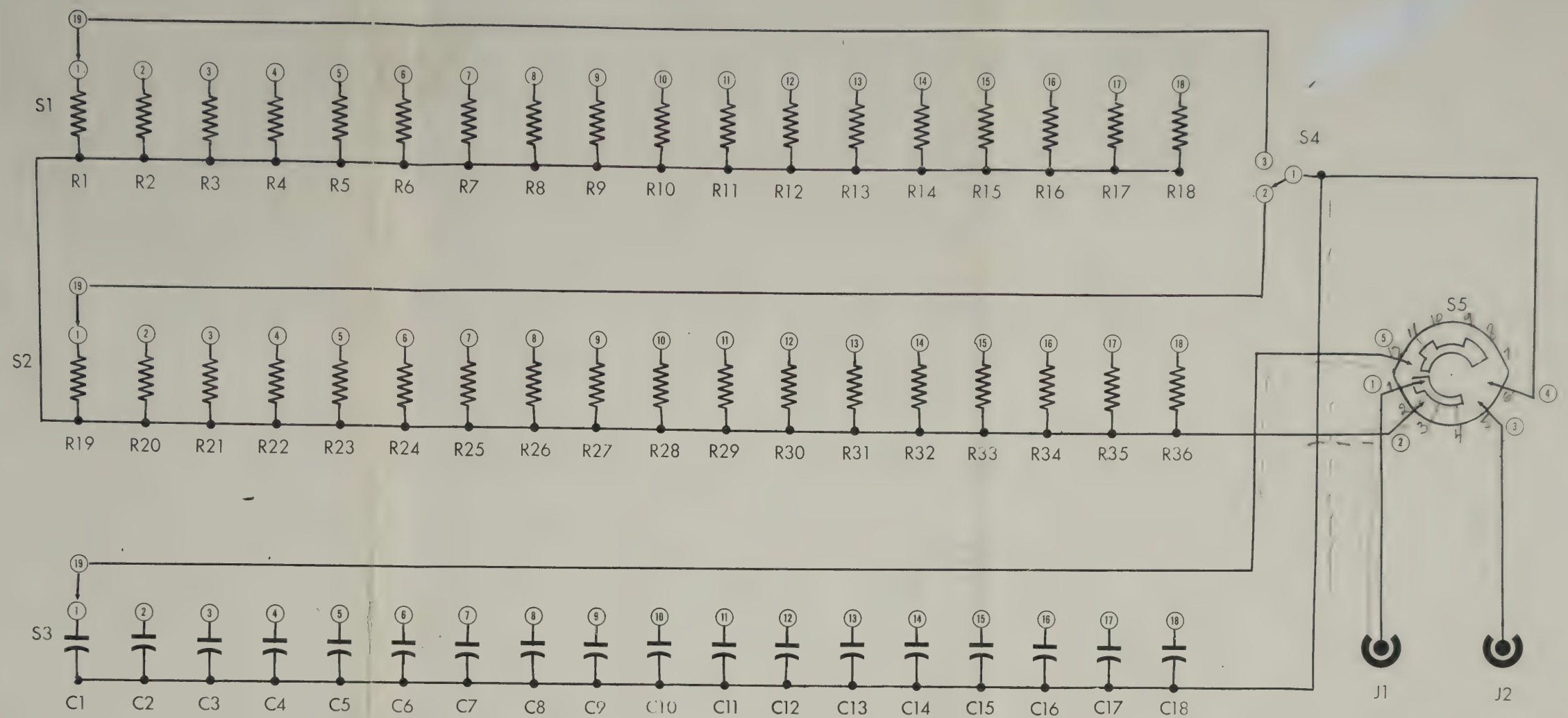
A set of spintites and a wire stripper are also very useful supplementary tools.

PARTS IDENTIFICATION: Please note that very many of the parts for which color coding is given may not be color coded, but have their values and ratings printed. The letter K is a multiplier ( $\times 1000$ ) and on resistors or capacitors indicates that the printed numerical value must be multiplied by one thousand to obtain the value in ohms or micro-micro farads respectively. Note also that one microfarad (mf) is equal to one million; micro-microfarads (mmf). To aid in rapid identification, keep in mind that 5%, 10%, and 20% resistors are color coded whereas 1% resistor have their values printed; also that molded tubular capacitors may or may not be color coded, whereas disc capacitors and electrolytics will always have their values printed. Please note the following relationships between the units used to express resistance or capacity.

$1,000,000 \text{ ohms } (\Omega) = 1000 \text{ kilohms } (K\Omega) = 1 \text{ megohm } (M\Omega)$   
 $1,000,000 \text{ micro-micro farads } (mmf) = 1 \text{ micro farads } (mf)$

CONSTRUCTION PROCEDURE: The complete step-by-step mounting and wiring procedure follows. To keep the drawings uncrowded, unnecessary repetition of mounting or wiring details may be omitted. Note: The abbreviation (C) means connect but do not solder (until other leads have been connected). The abbreviation (S) means connect and solder. Bend the ground lug tabs on the sockets toward the chassis to prevent accidental shorting to the socket pins.





MODEL 1140 SERIES-PARALLEL R-C COMBINATION BOX SCHEMATIC DIAGRAM  
REPLACEMENT PARTS LIST

Stock#	Sym.	Description	Am't.	Stock#	Sym.	Description	Am't.	Stock#	Sym.	Description	Am't.
21005	C1	cap., sil., mica, .0001 mfd-500V, 5% (100 mmf)	1	10863	R8	res., 220 $\Omega$ (red, red, brown, silver) 1W, $\pm 10\%$	1	10837	R34	res., 4.7M $\Omega$ (yellow, violet, green, silver) 1W, $\pm 10\%$	1
21006	C2	cap., sil., mica, .00022 mfd-500V, 5% (220 mmf)	1	10862	R9	res., 330 $\Omega$ (orange, orange, brown, silver) 1W, $\pm 10\%$	1	10836	R35	res., 6.8M $\Omega$ (blue, grey, green, silver) 1W, $\pm 10\%$	1
21007	C3	cap., sil., mica, .00047 mfd-500V, 5% (470 mmf)	1	10861	R10	res., 470 $\Omega$ (yellow, violet, brown, silver) 1W, $\pm 10\%$	1	10835	R36	res., 10M $\Omega$ (brown, black, blue, silver) 1W, $\pm 10\%$	1
20016	C4	cap., molded, paper, .001 mfd-600V, 10%	1	10860	R11	res., 680 $\Omega$ (blue, grey, brown, silver) 1W, $\pm 10\%$	1	60022	S1, 2, 3	switch, rotary, 1P-18 Pos.	3
20017	C5	cap., molded, paper, .0015 mfd-600V, 10%	1	10859	R12	res., 1K $\Omega$ (brown, black, red, silver) 1W, $\pm 10\%$	1	62002	S4	switch, slide, 1P-2 Pos.	1
20018	C6	cap., molded, paper, .0022 mfd-600V, 10%	1	10858	R13	res., 1.5K $\Omega$ (brown, green, red, silver) 1W, $\pm 10\%$	1	60059	S5	switch, rotary, 3P-6 Pos.	1
20019	C7	cap., molded, paper, .0033 mfd-600V, 10%	1	10857	R14	res., 2.2K $\Omega$ (red, red, red, silver) 1W, $\pm 10\%$	1	40001		nut, hex, #3/8-32	4
20020	C8	cap., molded, paper, .0047 mfd-600V, 10%	1	10856	R15	res., 3.3K $\Omega$ (orange, orange, red, silver) 1W, $\pm 10\%$	1	40007		nut, hex, #4-40	2
20021	C9	cap., molded, paper, .0068 mfd-600V, 10%	1	10855	R16	res., 4.7K $\Omega$ (yellow, violet, red, silver) 1W, $\pm 10\%$	1	40008		nut, hex, #8-32	4
20022	C10	cap., molded, paper, .01 mfd-600V, 10%	1	10854	R17	res., 6.8K $\Omega$ (blue, grey, red, silver) 1W, $\pm 10\%$	1	41016		screw, #4-40 x 1/4	6
20023	C11	cap., molded, paper, .015 mfd-600V, 10%	1	10853	R18	res., 10K $\Omega$ (brown, black, orange, silver) 1W, $\pm 10\%$	1	42000		washer, lock 3/8	4
20024	C12	cap., molded, paper, .022 mfd-600V, 10%	1	10852	R19	res., 15K $\Omega$ (brown, green, orange, silver) 1W, $\pm 10\%$	1	42001		washer, flat 3/8	4
20025	C13	cap., molded, paper, .033 mfd-600V, 10%	1	10851	R20	res., 22K $\Omega$ (red, red, orange, silver) 1W, $\pm 10\%$	1	42007		washer, lock #4	2
20026	C14	cap., molded, paper, .047 mfd-600V, 10%	1	10850	R21	res., 33K $\Omega$ (orange, orange, orange, silver) 1W, $\pm 10\%$	1	42043		washer, bakelite shoulder	2
20027	C15	cap., molded, paper, .068 mfd-600V, 10%	1	10849	R22	res., 47K $\Omega$ (yellow, violet, orange, silver) 1W, $\pm 10\%$	1	42044		washer, bakelite flat	2
20028	C16	cap., molded, paper, .1 mfd-600V, 10%	1	10848	R23	res., 68K $\Omega$ (blue, grey, orange, silver) 1W, $\pm 10\%$	1	42046		washer, flat #8	2
20029	C17	cap., molded, paper, .15 mfd-400V, 10%	1	10847	R24	res., 100K $\Omega$ (brown, black, yellow, silver) 1W, $\pm 10\%$	1	43004		lug, #8	2
20030	C18	cap., molded, paper, .22 mfd-400V, 10%	1	10846	R25	res., 150K $\Omega$ (brown, green, yellow, silver) 1W, $\pm 10\%$	1	53006		knob, bar	4
52001	J1-2	binding post	2	10845	R26	res., 220K $\Omega$ (red, red, yellow, silver) 1W, $\pm 10\%$	1	58000		wire, hook-up	length
10870	R1	res., 15 $\Omega$ (brown, green, black, silver) 1W, $\pm 10\%$	1	10844	R27	res., 330K $\Omega$ (orange, orange, yellow, silver) 1W, $\pm 10\%$	1	58300		spaghetti	length
10869	R2	res., 22 $\Omega$ (red, red, black, silver) 1W, $\pm 10\%$	1	10843	R28	res., 470K $\Omega$ (yellow, violet, yellow, silver) 1W, $\pm 10\%$	1	58500		wire, #18 bare	length
10868	R3	res., 33 $\Omega$ (orange, orange, black, silver) 1W, $\pm 10\%$	1	10842	R29	res., 680K $\Omega$ (blue, grey, yellow, silver) 1W, $\pm 10\%$	1	58501		wire, #22 bare	length
10867	R4	res., 47 $\Omega$ (yellow, violet, black, silver) 1W, $\pm 10\%$	1	10841	R30	res., 1M $\Omega$ (brown, black, green, silver) 1W, $\pm 10\%$	1	80060		panel	1
10866	R5	res., 68 $\Omega$ (blue, grey, black, silver) 1W, $\pm 10\%$	1	10840	R31	res., 1.5M $\Omega$ (brown, green, green, silver) 1W, $\pm 10\%$	1	88042		cabinet	1
10865	R6	res., 100 $\Omega$ (brown, black, brown, silver) 1W, $\pm 10\%$	1	10839	R32	res., 2.2M $\Omega$ (red, red, green, silver) 1W, $\pm 10\%$	1	66065		manual of instructions (wired)	1
10864	R7	res., 150 $\Omega$ (brown, green, brown, silver) 1W, $\pm 10\%$	1	10838	R33	res., 3.3M $\Omega$ (orange, orange, green, silver) 1W, $\pm 10\%$	1	66314		manual of instructions (kit)	1

ment. It is intended to serve those customers who are not adequately familiar with electronics to make use of the EICO Service Consultation facilities, or whose difficulties cannot be solved by correspondence.

For all out-of-warranty units, there is a minimum labor and handling fee. For the Model No. 1140, this fee is \$3.00. Charges for components replaced are additional to the minimum fee.

For in-warranty completed kit units, there is a minimum labor and handling fee. For the Model No. 1140, this fee is \$3.00. There is no charge for a replaced defective part provided that the terms and conditions of the warranty for no charge replacement are not violated in the judgement of EICO.

For in-warranty factory-wired units, there is no labor and handling fee if the unit complies with the terms and conditions of the warranty in the judgement of EICO. However, if the terms and conditions of the warranty are violated, then there will be charged to customer a minimum labor and handling fee plus the cost of parts replaced.

In all cases, the unit must be sent to the factory transportation prepaid, and the unit will be returned to the customer transportation collect.

The services rendered for the minimum labor and handling fee are the correction of any minor wiring errors (not extensive corrections or re-wiring), the labor involved in replacing defective parts, and any adjustments, alignment, or calibration procedures that would normally be performed on a factory-wired unit. Units not wired according to instructions, or modified in any way, or showing evidence of the use of acid core solder, will not be serviced and will be returned to the customer forthwith.

Units requiring extensive corrections or re-wiring will incur an additional labor charge which will be set by EICO. The customer will be informed of this situation and written authorization from the customer will be required before the work is done.

Please note: minimum labor and handling fees are subject to revision at any time.

## LOCAL REPAIR FACILITIES

Out-of-warranty repair work may also be performed by authorized service stations as well as the EICO factory. A list of authorized service stations is provided with this manual. The roster of stations may change from time to

time, and if considerable time has elapsed since you purchased your unit, you are advised to contact the station you choose before sending the unit to them for repair. Use of a local service station will often result in faster service, and, usually, lower transportation costs.

It is necessary that you comply with the Shipping Instructions that follow when sending in a unit for service.

## SHIPPING INSTRUCTIONS

You are strongly advised to retain the original shipping carton and inserts in the case that re-shipment is required for service or any other purpose. The carton may be collapsed, for storage in as small a space as possible. In very many cases, the same carton is used for kit and factory-wired units so that the kit carton will serve for re-shipment of the completed kit.

To submit a unit for service, either to the factory or an authorized service station\*, fill out completely the Service Work Order form provided with the manual. Pack the unit very carefully, preferably in the original shipping carton with the original inserts.

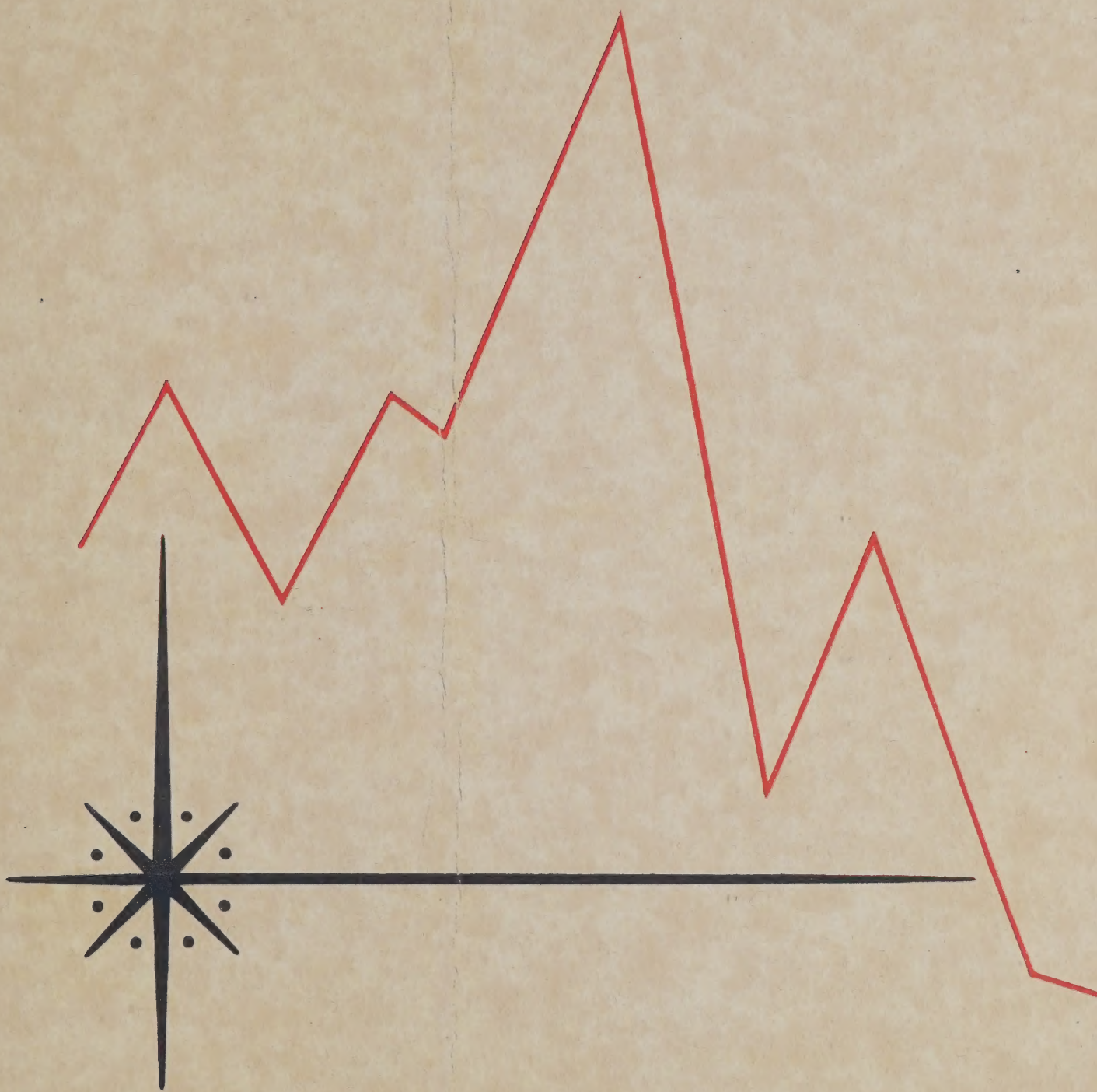
If this is not possible, use a strong oversize carton, preferably wood, allowing at least 3 inches of resilient packing material such as shredded paper or excelsior, to be inserted between all sides of the unit and the carton with strong gummed paper tape or strong twine, or both. Include the Service Work Order in the carton and in addition, attach a tag to the instrument on which is printed your name and address and brief reference to the trouble experienced. Affix "FRAGILE" or "HANDLE WITH CARE" labels to at least four sides of the carton, or print these words large and clear with a bright color crayon. Ship by prepaid Railway Express or parcel post to:

Electronic Instrument Co., Inc.  
33-00 Northern Blvd.  
Long Island City 1, N.Y.  
Attention: Service Department

Include your name and address on the outside of the carton. Return shipment will be made transportation charges collect. Note that a carrier cannot be held liable for damages in transit, if packing, IN HIS OPINION, is insufficient.

\*Authorized service stations are for out-of-warranty units only, unless the station is specifically noted on the List of Authorized Service Stations to be authorized for other work.





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